

## REMARKS

Claims 1 to 49 remain pending.

Claims 1 to 49 have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failure to particularly point and distinctly claim the subject matter regarded as the invention. The terms "usual method" and "conventional method" in claims 1, 15 and 36 were deemed indefinite. Claims 2, 16 and 17 were said not to provide units of measurement. References to sintering in the germania rich atmosphere in claims 10 and 30 were said to lack antecedent basis. The term "improved" in claim 15 was deemed indefinite. The terms "developed fibers," "RE ion" and "the two" in claim 24 was said to lack antecedent basis. The term "the pump beam" in claim 25 was said to lack antecedent basis. The term "the fibers" in claim 26 was said to lack antecedent basis. The terms "the developed fibers" and "the fiber" in claim 29 was said to lack antecedent basis. The term "of RE" in claims 32 and 33 was said to lack antecedent basis. The term "Er salts" in claim 45 was said to lack antecedent basis.

The rejection of claims 1, 2, 10, 15, 16, 17, 29, 32, 33, 36 and 45 under 35 U.S.C. 112, second paragraph, are traversed in view of the amendments to those claims. The rejection of claim 25 for the term "the pump beam" is not well taken. There is basis for that term in the preamble of claim 15. The rejection of claims 26 and 29 for the term "the fibers" is not well taken. There is basis for that term in subpart (l) (last line) of claim 15. The rejection of claim 45 for the term "Er salts" is not well taken. There is basis for that term in subpart (c) of claim 36. The term in claim 45 was amended to correct a typographical error.

Claims 14, 35 and 49 have been rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,058,976 to DiGiovanni et al. (the DiGiovanni patent). Claims 14, 35 and 49 were said to be product-by-process claims wherein only product limitations were significant.

The rejection of claims 14, 35 and 49 under 35 U.S.C. 102(b) is not well taken because the optic fiber produced in the claims from which they depend are materially different than those

of the prior art. As discussed below, the optic fiber of the present invention affords has features and advantages unappreciated in the prior art.

Claims 1 to 13, 15 to 34 and 36 to 48 have been rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,125,659 to Yang (the Yang patent) and the DiGiovanni patent. The Action admits that the Yang patent does not disclose the particular times, concentrations, temperatures, the coating of the preform with a silica tube, particular chemical attributes of the process, or the claimed fiber attributes. The DiGiovanni patent is said to disclose the use of phosphorus and fluorine in the cladding layer, placement of a silica tube over a doped preform prior to drawing into a fiber, use of erbium chloride as a doping salt, use of aluminum chloride salt, use of chlorine/oxygen mixture to dehydrate a coating, sintering in a germania atmosphere, and oxidizing prior to drying. Claims 1 to 13, 15 to 34 and 36 to 48 were deemed obvious in view of the combination of the teachings of the patents.

Claims 1 to 13, 15 to 34 and 36 to 48 distinguish the combination of the Yang and DiGiovanni patents. Independent claims 1, 15 and 36 require that dehydration take place in the presence of excess chlorine and oxygen and helium. Neither the Yang nor the DiGiovanni patent disclose sintering in the presence of helium. Thus, the combination thereof cannot yield the claimed invention. The presence of helium is advantageous in that it, being a lighter gas, with smaller molecular size, is beneficial in removing trapped gases and moisture in the porous soot layer.

Claims 1 to 13, 15 to 34 and 36 to 48 further distinguish the combination of the Yang and DiGiovanni patents. Independent claims 1, 15 and 36 require that sintering take place in the presence of a mixture of oxygen and helium and  $\text{GeCl}_4$ . Neither the Yang nor the DiGiovanni patent disclose sintering in the presence of a mixture of oxygen and helium and  $\text{GeCl}_4$ . Thus, the combination thereof cannot yield the claimed invention. By sintering in the presence of germanium, the level of germania in the soot layer is increased, which increases the refractive index of the core and the numerical aperture of the fiber. The increase in numerical aperture

enhances transmission capacity and, ultimately, the pumping efficiency of the rare earth-doped fiber.

Claims 1 to 13, 15 to 34 and 36 to 48 still further distinguish the combination of the Yang and DiGiovanni patents. Independent claims 1, 15 and 36 require that the solution be drained out at a rate in the range of 10-50 cc/minute. Applicants have discovered that rates in this range are important in achieving homogeneity along the length of the preform and the Gaussian rare earth distribution along the cross-section of the fiber.

Claims 1 to 13, 15 to 34 and 36 to 48 still yet further distinguish the combination of the Yang and DiGiovanni patents. Independent claims 1, 15 and 36 require that the tube be heated in the presence of  $O_2$  and He. The heating temperature can also vary over the indicated ranges based on composition and temperature of the rare earth and codopants. The presence of helium is beneficial in removing trapped gases and solvent in the porous soot.

Claims 1 to 49 still yet further distinguish the combination of the Yang and DiGiovanni patents. The porous soot layer in the claimed invention is obtained by depositing evaporated  $SiO_2+GeO_2+P_2O_5$ . Neither the Yang nor the DiGiovanni patent disclose such a porous soot layer. Thus, the combination of the patents cannot yield the claimed invention.

Reconsideration of claims 1 to 49 is deemed warranted in view of the foregoing, and allowance of said claims is earnestly solicited.

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Respectfully submitted,



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